

What is claimed is:

1. An SDH ring network comprising:

a transmission & reception node; and

a PCA insertion & reception node, which are

5 interconnected in a ring form,

the transmission & reception node including,

10 a first function portion for setting a working path

and a protection path in advance,

15 a second function portion for setting a transmission

value into the K3 or K4 byte in the overhead part of an

SDH signal independently on the working path and the

protection path, and

20 a path switch for selecting either the working path

or the protection path depending on the state of the received

15 K3 or K4 byte, and

the PCA insertion & reception node including,

25 an insertion switch for selecting either a received

signal is to be passed through or a PCA (Protection Channel

Access) signal is to be inserted thereto, and

30 a bridge for dropping a received signal and at the

same time passing through the received signal.

2. The SDH ring network according to claim 1,

wherein, in regard to transmission values in the K3 or

25 K4 byte to be set by the transmission & reception node,

when the network is maintained in an ordinary state having

no failure, a signal condition SC indicating 'PCA

inapplicable' is set for the working path, while a signal condition SC indicating 'PCA applicable' and a switch condition SWC indicating 'switchover not requested' are set for the protection path, and

5 when a failure is detected on the working path, a switch condition SWC indicating 'request for switchover' is set to transmit, and on receipt of the switch condition SWC indicating 'request for switchover', a signal condition SC indicating 'PCA inapplicable' is set for the protection

10 path.

3. The SDH ring network according to claim 1,  
wherein, when receiving a pass-through signal having the signal condition SC of 'PCA applicable' in the K3 or  
15 K4 byte, the PCA insertion & reception node selects PCA signal to transmit a PCA output signal, in which a switch condition SWC is replaced with the switch condition SWC received in the K3 or K4 byte of a pass-through signal input, and a signal condition SC indicating 'PCA' is set into the  
20 K3 or K4 byte, and

when receiving a pass-through signal having the signal condition SC of 'PCA inapplicable' in the K3 or K4 byte, the PCA insertion & reception node selects the pass-through signal input and outputs the pass-through signal input to  
25 the PCA output signal.

4. The SDH ring network according to claim 1,

wherein, when receiving a drop or pass-through signal having a signal condition SC of 'PCA' in the K3 or K4 byte, the PCA insertion & reception node selects a PCA signal in the pass-through signal input and outputs the PCA signal,  
5 and

when receiving a drop or pass-through signal having a signal condition SC of other than 'PCA' in the K3 or K4 byte, the PCA insertion & reception node outputs an alarm indication signal (AIS) in the PCA output signal.

10

5. The SDH ring network according to claim 2,  
wherein the transmission & reception node monitors a PDH input signal and, on detection of a failure in the PDH input signal, the transmission & reception node fixes  
15 a signal condition SC indicating 'PCA applicable' and a switch condition SWC indicating 'no request for switchover' in the K3 or K4 byte for the protection path, and the PCA insertion node continues inserting a PCA signal.

20 6. The SDH ring network according to claim 2,

wherein the transmission & reception node monitors a VCn input signal, and on detection of a failure in the VCn input signal, the transmission & reception node fixes a signal condition SC indicating 'PCA applicable' and a  
25 switch condition SWC indicating 'no request for switchover' in the K3 or K4 byte for the protection path, and the PCA insertion node continues inserting a PCA signal.

7. The SDH ring network according to claim 2,  
wherein the PCA insertion & reception node monitors  
a PDH PCA signal input, and on detection of a failure in  
5 the PDH PCA signal input, the PCA insertion & reception  
node fixes a selection condition so as to select a  
pass-through signal input, to obtain the UPSR configuration  
without applying PCA so as to shorten a failure relief time.

10 8. The SDH ring network according to claim 2,  
wherein the PCA insertion & reception node monitors  
a VCn PCA signal input, and on detection of a failure in  
the VCn PCA signal input, the PCA insertion & reception  
node fixes a selection condition so as to select a  
15 pass-through signal input, to obtain the UPSR configuration  
without applying PCA.

9. The SDH ring network according to claim 3,  
wherein the transmission & reception node monitors  
20 a PDH input signal and, on detection of a failure in the  
PDH input signal, the transmission & reception node fixes  
a signal condition SC indicating 'PCA applicable' and a  
switch condition SWC indicating 'no request for switchover'  
in the K3 or K4 byte for the protection path, and the PCA  
25 insertion node continues inserting a PCA signal.

10. The SDH ring network according to claim 3,

wherein the transmission & reception node monitors a VCn input signal, and on detection of a failure in the VCn input signal, the transmission & reception node fixes a signal condition SC indicating 'PCA applicable' and a 5 switch condition SWC indicating 'no request for switchover' in the K3 or K4 byte for the protection path, and the PCA insertion node continues inserting a PCA signal.

11. The SDH ring network according to claim 3,  
10 wherein the PCA insertion & reception node monitors a PDH PCA signal input, and on detection of a failure in the PDH PCA signal input, the PCA insertion & reception node fixes a selection condition so as to select a pass-through signal input, to obtain the UPSR configuration  
15 without applying PCA so as to shorten a failure relief time.

12. The SDH ring network according to claim 3,  
wherein the PCA insertion & reception node monitors a VCn PCA signal input, and on detection of a failure in the VCn  
20 PCA signal input, the PCA insertion & reception node fixes a selection condition so as to select a pass-through signal input, to obtain the UPSR configuration without applying PCA.

25 13. The SDH ring network according to claim 4,  
wherein the transmission & reception node monitors a PDH input signal and, on detection of a failure in the

PDH input signal, the transmission & reception node fixes a signal condition SC indicating 'PCA applicable' and a switch condition SWC indicating 'no request for switchover' in the K3 or K4 byte for the protection path, and the PCA  
5 insertion node continues inserting a PCA signal.

14. The SDH ring network according to claim 4,  
wherein the transmission & reception node monitors a VCn input signal, and on detection of a failure in the VCn  
10 input signal, the transmission & reception node fixes a signal condition SC indicating 'PCA applicable' and a switch condition SWC indicating 'no request for switchover' in the K3 or K4 byte for the protection path, and the PCA  
insertion node continues inserting a PCA signal.

15  
15. The SDH ring network according to claim 4,  
wherein the PCA insertion & reception node monitors a PDH PCA signal input, and on detection of a failure in the PDH PCA signal input, the PCA insertion & reception  
20 node fixes a selection condition so as to select a pass-through signal input, to obtain the UPSR configuration without applying PCA so as to shorten a failure relief time.

16. The SDH ring network according to claim 4,  
25 wherein the PCA insertion & reception node monitors a VCn PCA signal input, and on detection of a failure in the VCn PCA signal input, the PCA insertion & reception node fixes

a selection condition so as to select a pass-through signal input, to obtain the UPSR configuration without applying PCA.

5

100 99 98 97 96 95 94 93 92 91 90 89 88 87 86 85 84 83 82 81 80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0